

Ringler interview with Fox re "Scavengers of the Sea"

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by David L. Ringler

When La Jollans spread their towels out in the sun along the La Jolla Shores beach they are oblivious to an incredible fact: the sand upon which they lie and walk is alive with marine beach worms living several inches below the surface.

According to Dr. Denis Fox, Professor of Marine Biochemistry at the University of California's Scripps Institution of Oceanography here in La Jolla, these tiny worms will ingest all the sand on La Jolla Shores once every five years, or 14,600 tons a year. The sand grains are covered with a microscopic slime which the organism lives on.

Dr. Fox, who recently spoke to a group of National Science Foundation high school students in Summer Auditorium at Scripps, explained the role of the "Scavengers of the Sea," groups of marine organisms which live on non-living organic matter suspended in the sea.

Explaining the earth as it was nearly five billion years ago, Dr. Fox pointed out that the evolution of organic matter began with only the most simple chemical compounds present: methane, ammonia, water, and hydrogen gas. Experiments conducted by UCSD's Dr. Stanley Miller while at the University of Chicago showed that an electrical discharge in a vapor of these compounds produced simple amino and fatty acids, and other carbon compounds, the building blocks of life itself!

Slowly but surely life was born. Mutation and climatic conditions came and went, and the vertebrate organisms appeared (animals with backbones). Only in the last one to four million years has man walked the earth-- a small fraction of the existence of our planet.

In the oceans that cover 71 percent of the earth's surface, life is the same endless struggle that it is on land. Only the fittest survive.

Sea water is full of inert and yet life-giving chemicals. Algae and other simple marine plant life assimilate these relatively simple molecules and are in turn eaten by what Dr. Fox terms "Sea Scavengers."

The "filterers" (such as the oyster, clam, and mussel) pass great quantities of sea water across a mucous sheet and retain only the essential foods for bodily utilization. A colony of one million mussels will pass out 22 million tons of water a year and remove perhaps 121 tons of organic matter from suspension.

The "sweepers" make up a second class. Such marine creatures as the sea cucumber and certain crustaceans literally sweep the floors of the seas and assimilate particles with brush-like projections in the mouth.

The beach worm mentioned earlier is a member of a third class, the "shovelers." The worm is only about one percent efficient in the utilization of the food it ingests, and so a prodigious amount of sand passes through their bodies in a short time. As many as 3000 beach worms will live beneath a square foot of damp sand.

The fourth and final class, called the "scrapers," is composed of such organisms as the sea snails and sea slugs. With their rasping tongues, called radulae, these animals search for food along the rocks clustered on the shore line. "The radula of a snail consists of a long strip of horny membrane on which are fastened many rows of minute recurved (curved inward) teeth."

Certain snails are fantastic eroders of rock, and one billion of them are able to wear away 2220 tons of siltstone in a single year.

The "Sea Scavengers" are a link in the chain of life that inhabits the seas-- a most vital link. Dr. Fox calls the sea a "vast biochemical theatre" in which action seems to go on without cessation. It is difficult to imagine such organisms as the simple but important snail had their beginning with the lightening that flashed across a primordial sky five billion years ago.